REMARKS

Claims 5-9, 11, 14, 15, 18, 25, 37-40, and 42-47 were pending in the application, prior to the present amendment. Claims 11, 43, and 44 were withdrawn from consideration, leaving claims 5-9, 14, 15, 18, 25, 37-40, 42, and 45-47 subject to examination. Claim 42 has been canceled. Claims 25, 37-40, 42, and 45-47 remain rejected under 35 U.S.C. § 112, first paragraph; claims 5, 6, 14, 15, 18, 25, 37, 39, 40, 42, and 47 remain rejected under 35 U.S.C. § 102(b); claims 5-9, 14, 15, 18, 25, 37-40, 42, and 45-47 remain rejected for obviousness-type double patenting; and claims 5 and 6 were rejected under 35 U.S.C. § 102(e). Each of the rejections is addressed as follows.

Rejection under 35 U.S.C. § 112, first paragraph

Claims 25, 37-40, 42, and 45-47 remain rejected under 35 U.S.C. § 112, first paragraph, on the basis that claim 42 still recites the terms antigen, peptide, and DNA molecule, and depends from independent claim 25, which thus encompasses antigens, peptides, and DNA molecules, even though claim 25 has been amended to specify polypeptide antigens. In response, Applicants have now canceled claim 42, without prejudice, which renders this rejection moot.

Rejections under 35 U.S.C. § 102

Claims 5, 6, 12, 14, 15, 18, 25, 37, 39, 40, 42, and 47 remain rejected under 35 U.S.C. § 102(b) as being anticipated by WO 96/31235, in light of the English version, U.S. Patent No. 6,126,938. This rejection is respectfully traversed.

The rejection is maintained on the basis that the phrase "consists essentially of" is open language, permitting additional method steps as long as they do not change the basic and novel

characteristics of the claimed method. On this matter, the Examiner states "[I]n light of the fact that WO96/31235 is directed to stimulating an immune response against Helicobacter pylori, and administers compositions (by a mucosal route in addition to the dorsolumbar route,) which does not change the basic and novel characteristic of the claimed methods, WO96' still anticipates the claimed invention." Applicants respectfully disagree with maintenance of the rejection on this ground.

In particular, Applicants submit that the addition of different routes of administration could be considered as changing the basic characteristics of the method, as the addition of such different routes could result in a very different immune response (in both quality and quantity). This is supported by the fact that WO 96/31235 (U.S. Patent No. 6,126,938) emphasizes the benefits of combining mucosal and dorsolumbar routes. For example, U.S. Patent No. 6,126,938 states, in highlighting that multiple routes of immunization are a basic feature of the '938 patent, that: "It has now been found that an immune response at a mucosal site of any kind and against an antigen of any kind could be greatly promoted by implanting an immunization protocol combining several routes" (column 3, lines 64-67). Thus, Applicants submit that the teachings of WO 96/31235 are outside of the scope of the present claims, and this rejection can therefore now be withdrawn.

In response to the Examiner's concern regarding the order of steps, Applicants again submit that the present claims specifying multiple steps (claim 25 and the claims that depend therefrom) have the mucosal administration specified as being a prime, with the parenteral administration being a boost. In the event of multiple rounds of vaccination, it would appear that the Examiner considers a regimen such as parenteral, mucosal, parenteral as encompassing a mucosal prime and parenteral boost. To address this concern, claim 25 has been amended to

specify that the mucosal prime is the initial immunization in the regimen. Applicants thus request that this rejection be withdrawn.

In response to the Examiner's concern regarding disclosure in WO 96/31235 of administration by the vaginal or rectal route, and the statement that such administration is a "subdiaphragmatic, systemic route," Applicants respectfully disagree. In particular, Applicants submit that the vaginal and rectal routes are mucosal, and not systemic. Although such administration may give rise to antibodies present in systemic circulation, the routes of administration are mucosal and not systemic. This understanding of the differences between these routes of administration is supported, for example, at page 6, lines 14-27 of WO 98/48835 (PCT/US98/08890), which corresponds to the present application. Applicants thus request that the rejection made on this basis be withdrawn.

Claim 5 was rejected under 35 U.S.C. § 102(b) as being anticipated by Fulginiti (1995), on the basis that Fulginiti utilized an aroA mutant strain of Salmonella to express *H. pylori* urease and that the cited Chen reference shows that such an approach is effective. In response, Applicants note that claim 5 specifies the administration of a polypeptide antigen, which is distinct from a plasmid present in a transformed bacterium, as taught by Fulginiti. Applicants thus request that this rejection be withdrawn.

Claims 5 and 6 were rejected under 35 U.S.C. § 102(e) as being anticipated by Michetti et al., U.S. Patent No. 6,290,962, in light of Guy (1997), on the basis that rectal administration is subdiaphragmatic and that the type of immune response induced is both systemic and mucosal. As stated in Applicants' prior reply, claims 5 and 6 require administration by a subdiaphragmatic, systemic route. In contrast to this, Michetti uses a rectal administration approach, which is mucosal. Even if systemic antibodies are induced, this does not mean that the approach used in

Michetti was systemic. This understanding of the differences between these routes of administration is supported, for example, at page 6, lines 14-27 of WO 98/48835 (PCT/US98/08890), which, as mentioned above, corresponds to the present application. Rather, the approach used by Michetti was a mucosal approach and, therefore, Applicants respectfully request that this rejection be withdrawn.

Double Patenting

The obviousness-type double patenting rejections over U.S. Patent No. 6,126,938 have been maintained. With respect to the order of administration, Applicants note that, as discussed above, claim 25 has been amended to specify that the initial administration in the claimed method is mucosal, followed by a parenteral boost. In view of this amendment, Applicants request that this ground for rejection be withdrawn.

As to the Examiner's reference to administration of antigens encoded by DNA in an expression cassette (paragraph 15 of the Office Action), Applicants note that the present claims specify administration of polypeptide antigens.

In response to the rejection of claims 5-8 and 18 over claims 1-14 of U.S. Patent No. 6,576,244, Applicants reiterate that the claims of the '244 patent require administration by injection of an *H. pylori* polypeptide and a particular adjuvant (i.e., an adjuvant comprising the heat-labile toxin of *E. coli*, the B subunit thereof, cholera toxin, or the B subunit thereof). These claims make no mention of administration by subdiaphragmatic, systemic routes, as required by the present claims. In addition, the present claims do not require use of the adjuvants listed in the claims of the '244 patent. In view of these differences, Applicants request that this rejection be withdrawn.

In response to the rejection of claim 5 over claims 1, 13, 15, and 18 of U.S. Patent No. 6,379,675, Applicants reiterate that the claims of the '675 patent require the administration of Osp antigens, which are *B. burgdorferi* lipoproteins, in contrast to the *H. pylori* polypeptide antigens of the present claims. The claims also require the enhancement of an immunological response to an OspC antigen. Even if the administration of Helicobacter antigens may also be covered, this does not change the fact that the methods are focused on Osp antigens. In view of these differences, Applicants request that this rejection be withdrawn.

In the rejection of claims 25, 37-40, 42, and 46 over claims 1-4 and 6-15 of U.S. Patent No. 6,585,975, reference is made to claim 42 as encompassing vaccine vectors, etc. As is noted above, claim 42 has been canceled. Thus, this rejection may now be withdrawn.

CONCLUSION

Applicants submit that the claims are in condition for allowance, and such action is respectfully requested. If there are any charges not covered or any credits, please apply them to Deposit Account No. 03-2095.

Respectfully submitted,

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